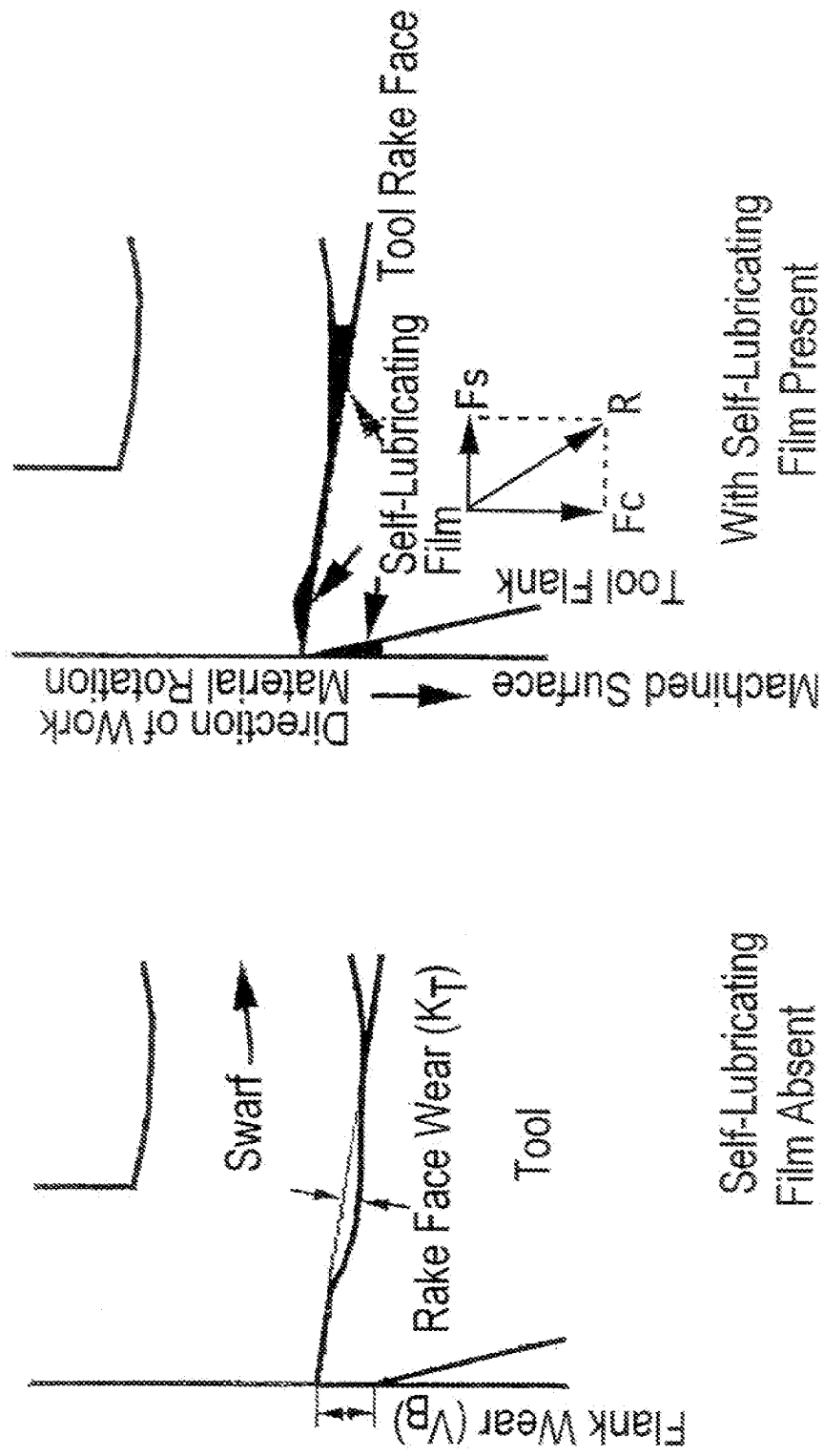
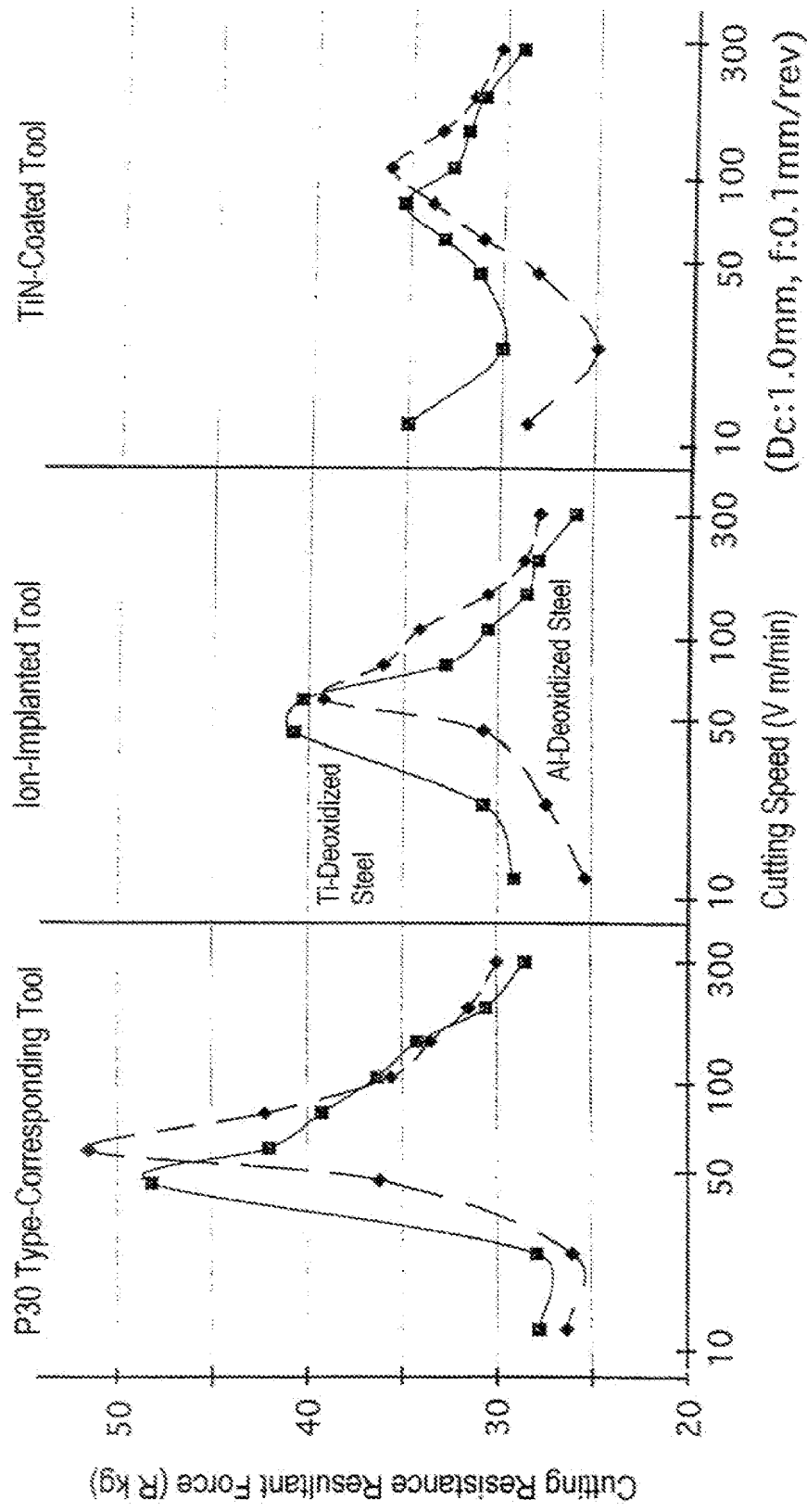


Fig. 1



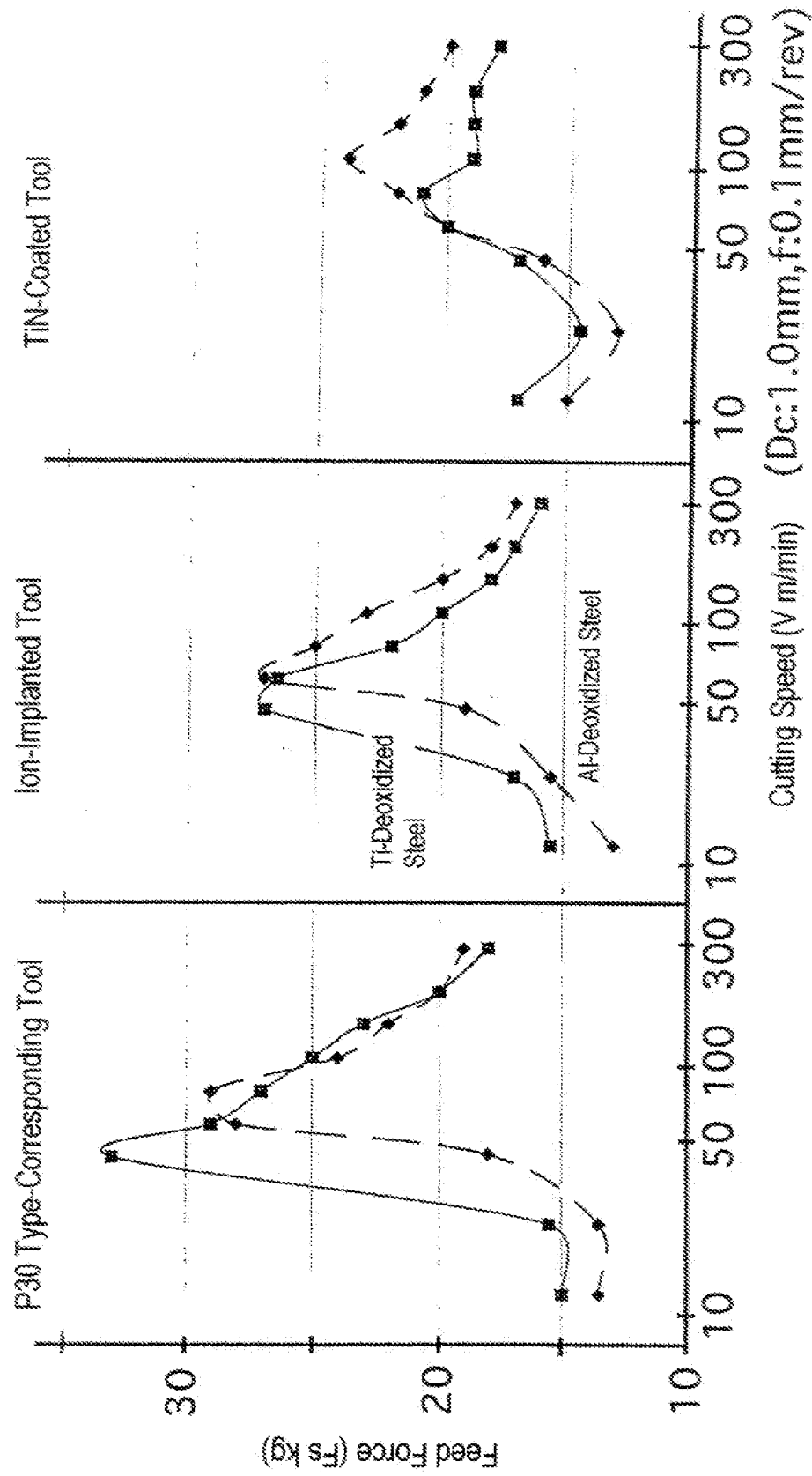
Formation State of Self-Lubricating Film in High Speed Cutting Region

Fig. 2



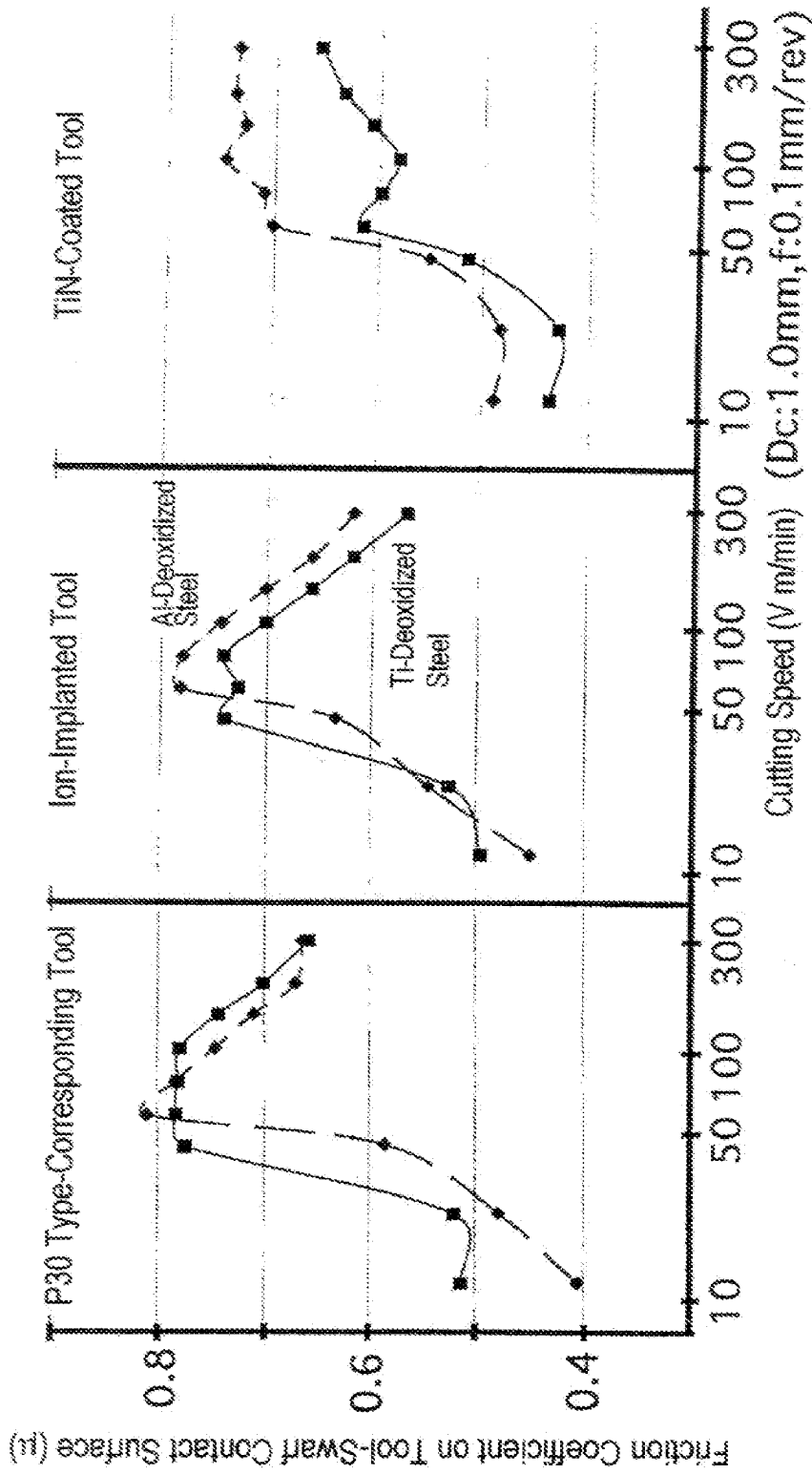
Relation between Cutting Resistance Resultant Force and Tool Material

Fig. 3



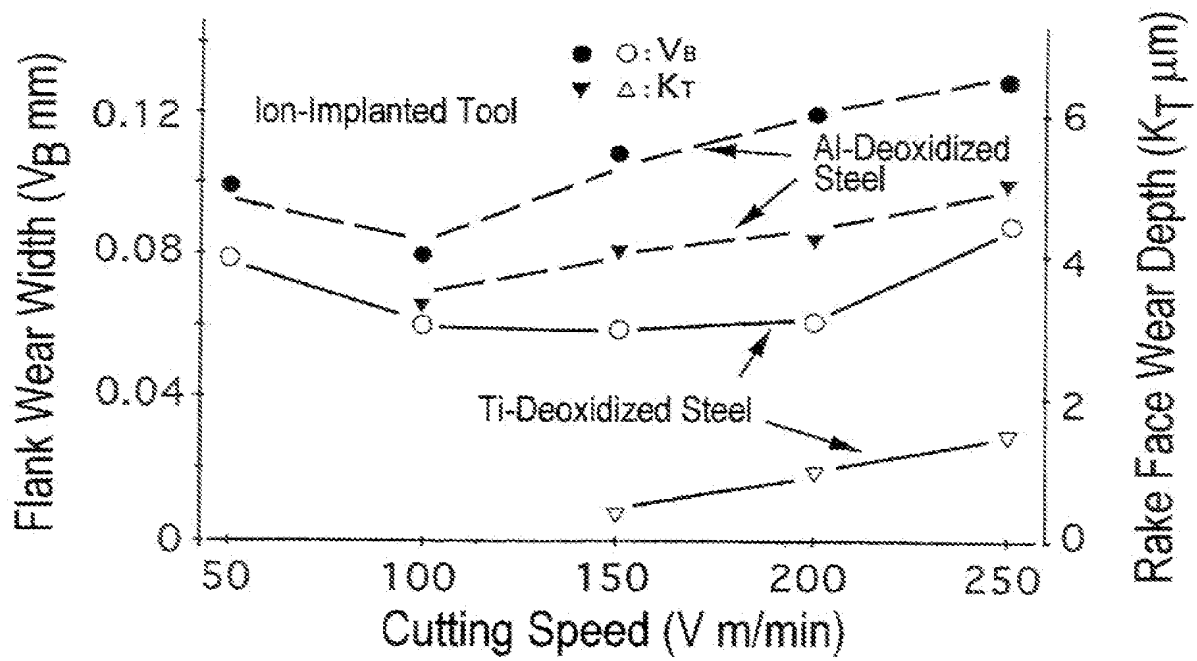
Relation between Feed Force and Tool Material

Fig. 4



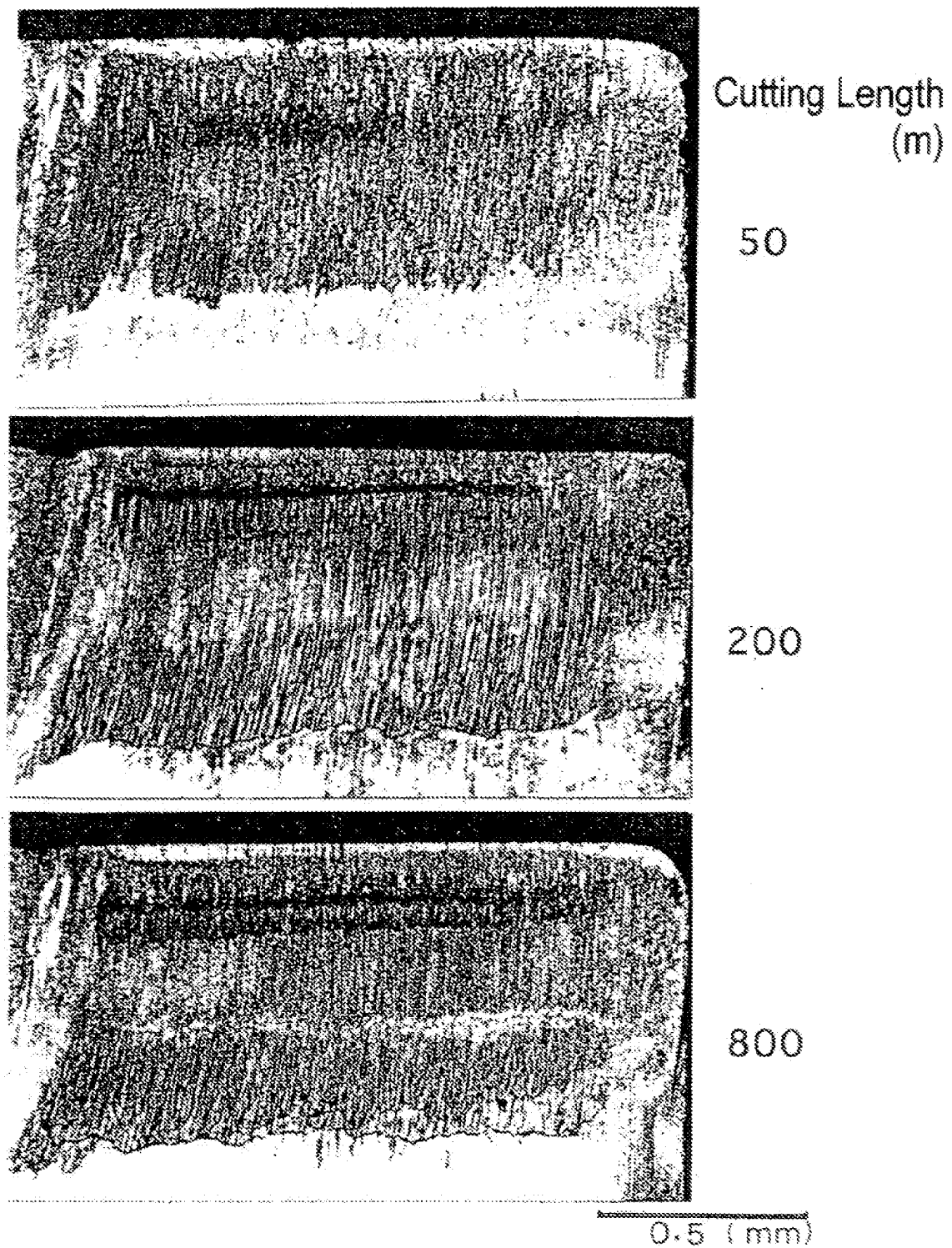
Relation between Friction Coefficient on  
Tool-Swarf Contact Surface and Tool Material

Fig. 5



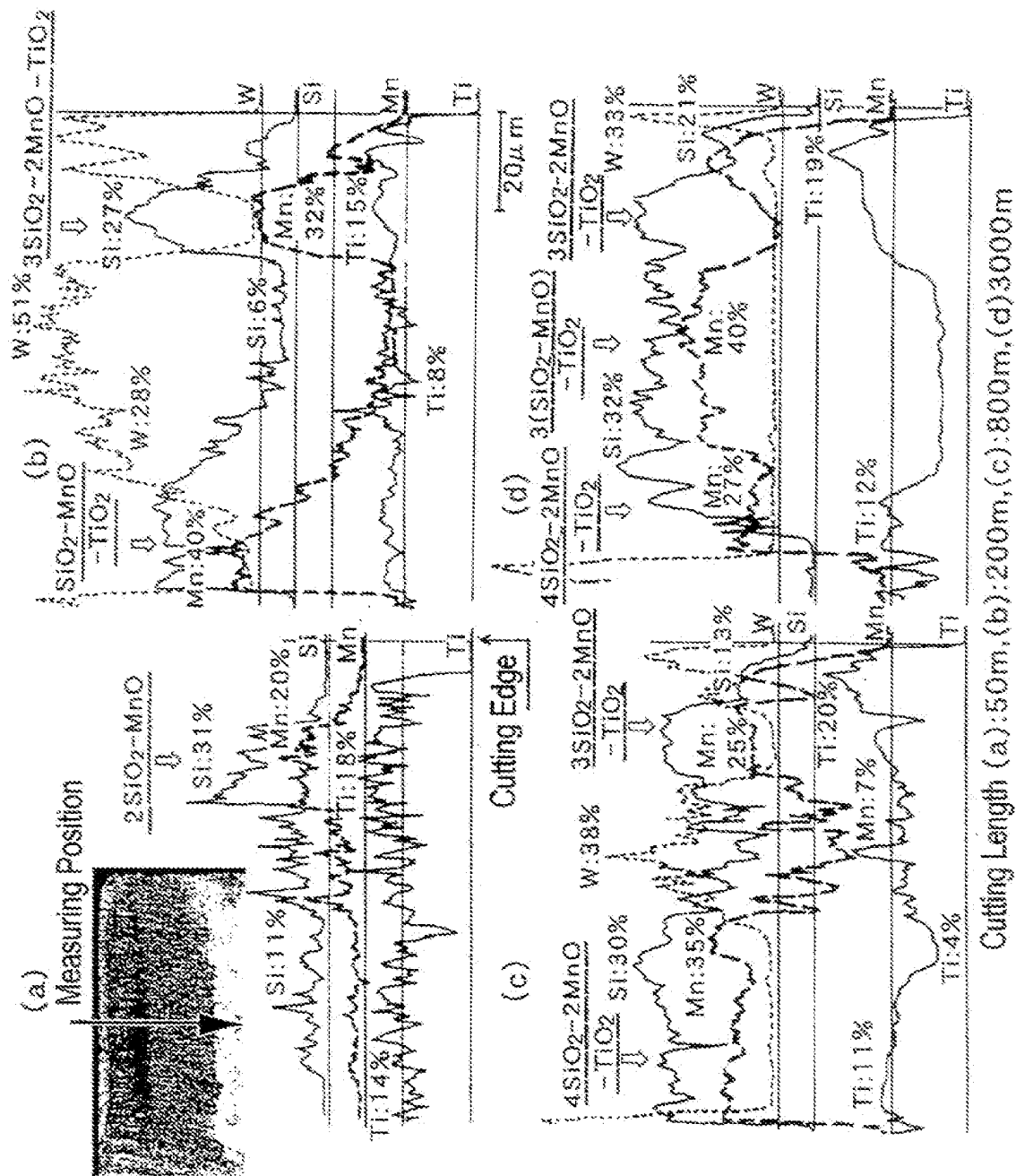
Tool Wear in Each Cutting Speed Region

Fig. 6



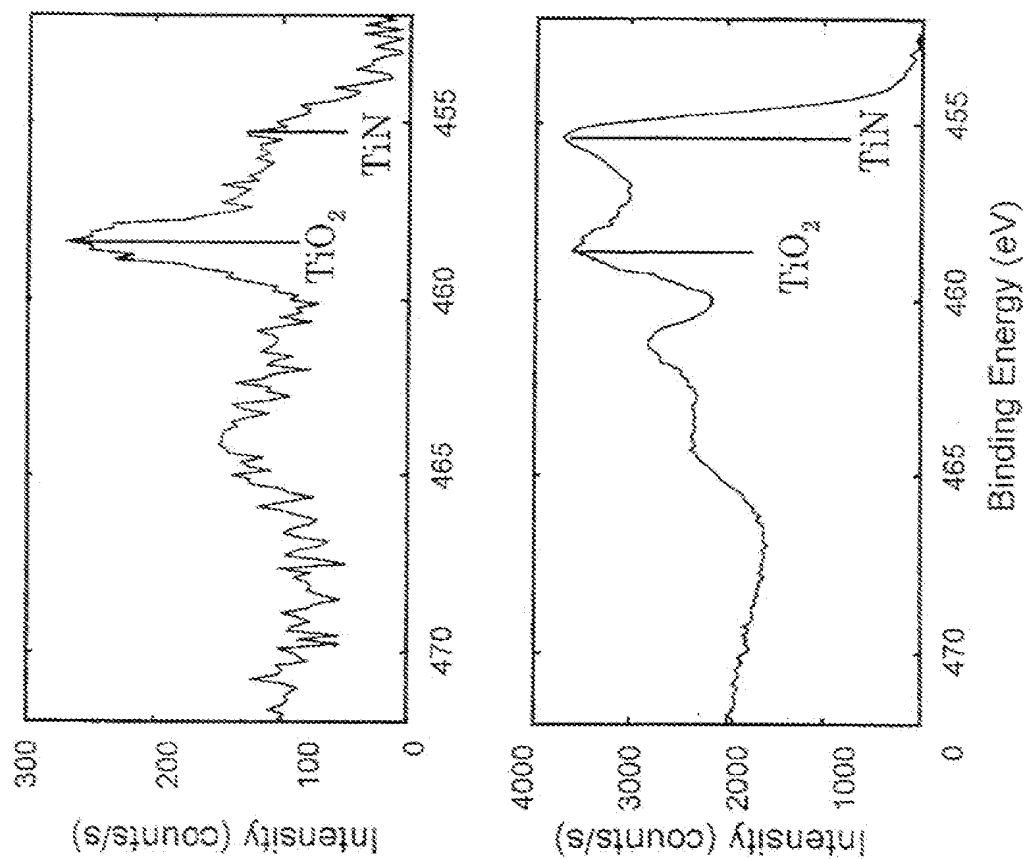
Formation State of Self-Lubricating Film  
during Ti-Deoxidized Steel Cutting

Fig. 7



Composition of Self-Lubricating Film during Ti-Deoxidized Steel Cutting (S45C)

Fig. 8



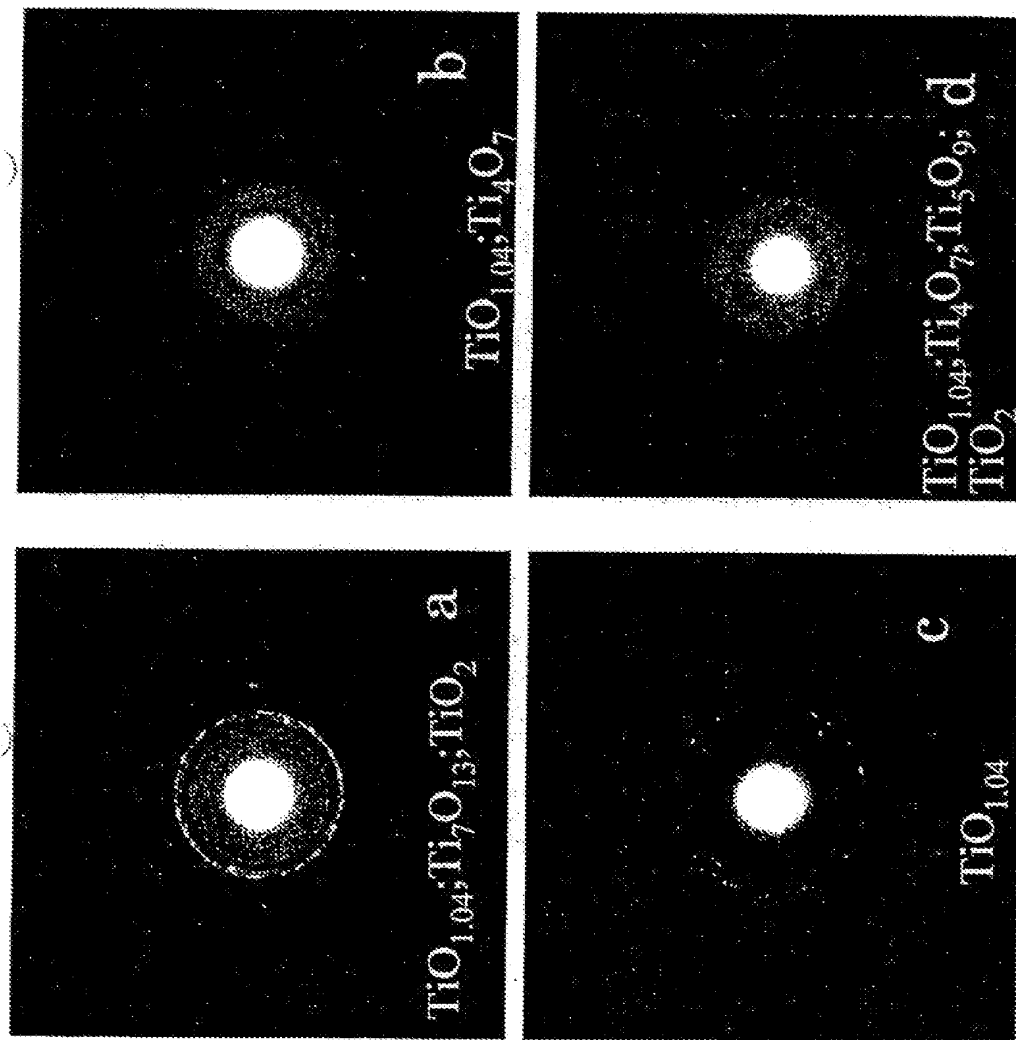
Results of Analysis by XPS:

Upper: Unimplanted TiN-Coated Tool

Lower: Cl Ion-Implanted TiN-Coated Tool

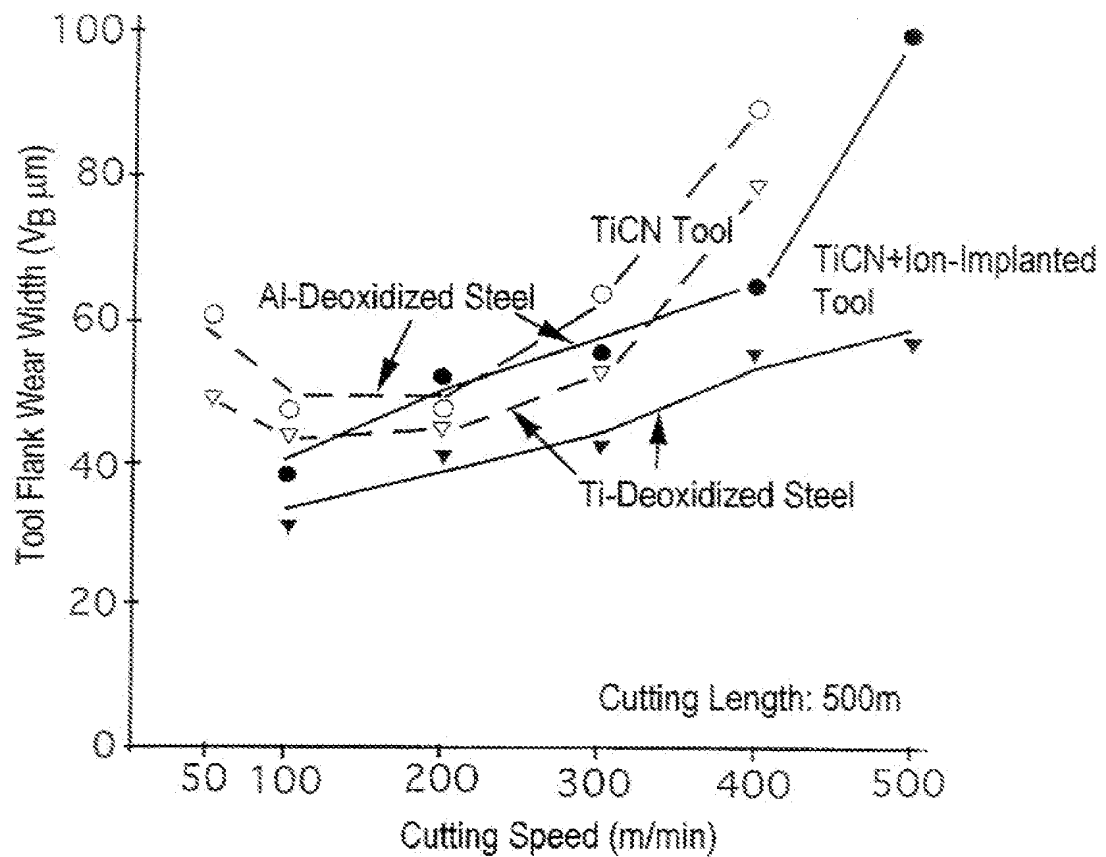


Fig. 9



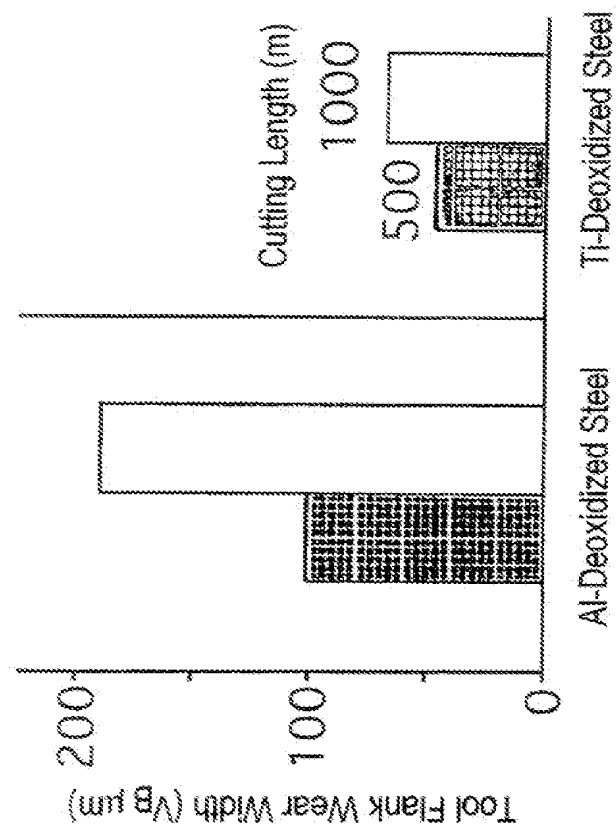
Results of SAED Analysis of Self-Lubricating Film Constituents

Fig. 10



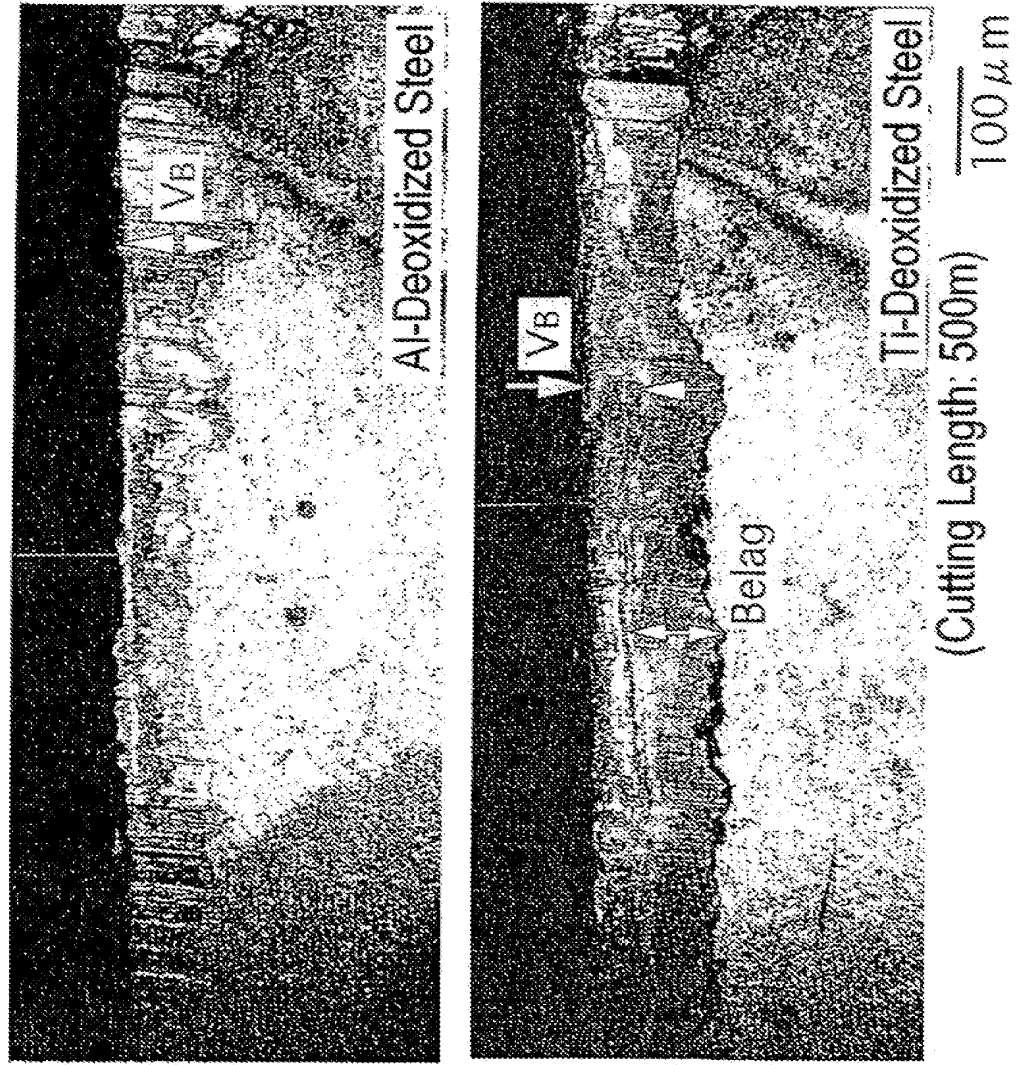
Tool Flank Wear Width after Cutting over  
Constant Distance in Each Cutting Speed Region

Fig. 11



Influence of Cutting Length on Tool Flank Wear Width  
at Cutting Speed of 500 m/min

Fig. 12



State of Flank Wear at Cutting Speed of 500 m/min

Fig. 13

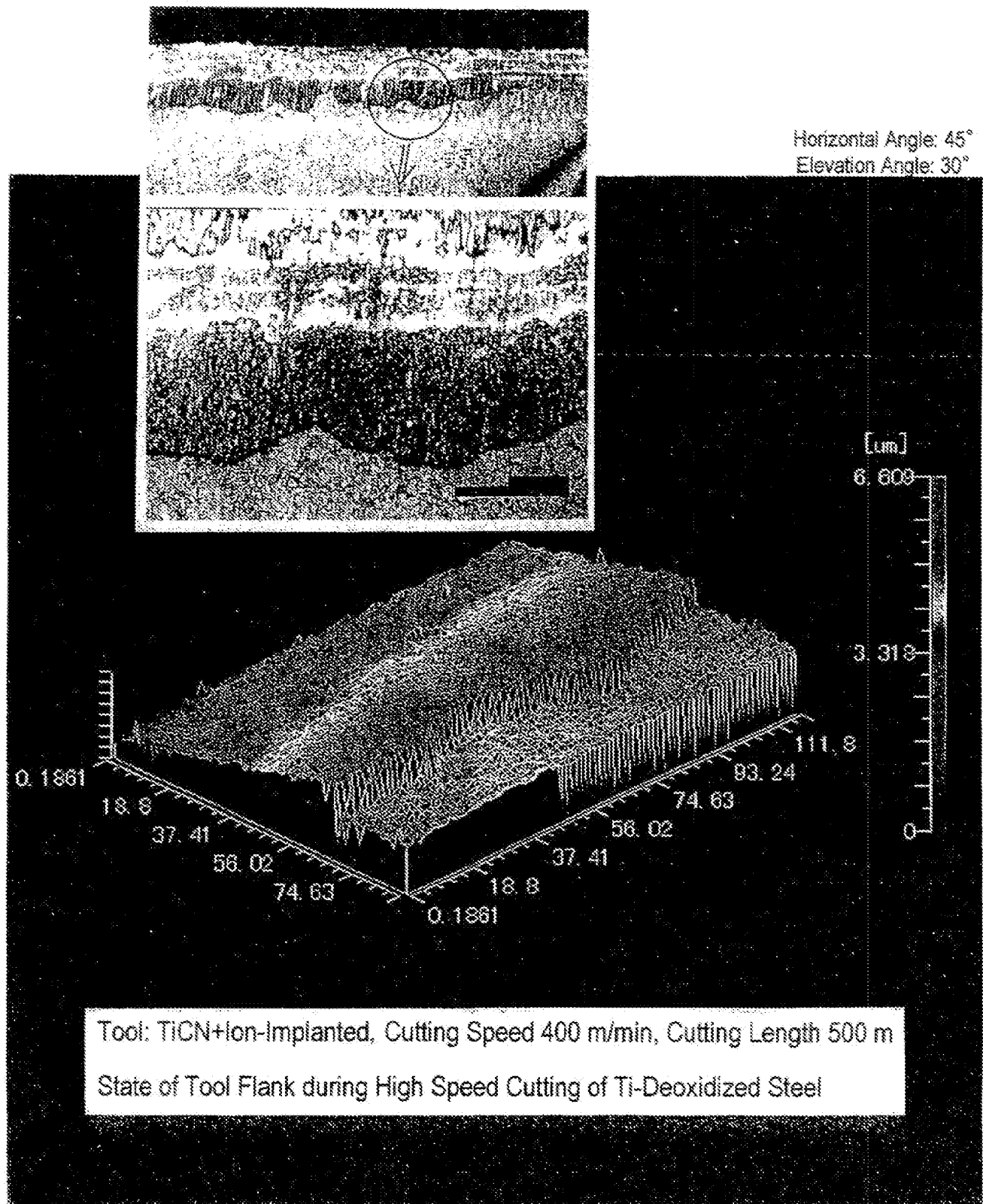


Fig. 14

